



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/611,525	07/01/2003	Fred C. Tramm	000329-804/TRWP122US	2180
23623	7590	05/17/2007		
AMIN, TUROCY & CALVIN, LLP 1900 EAST 9TH STREET, NATIONAL CITY CENTER 24TH FLOOR, CLEVELAND, OH 44114			EXAMINER ZHENG, EVA Y	
			ART UNIT 2611	PAPER NUMBER
			MAIL DATE 05/17/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/611,525

Applicant(s)

TRAMM ET AL.

Examiner

Eva Yi Zheng

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 2/7/07.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Arguments***

1. Applicant's arguments with respect to claims 1-30 have been considered but are moot in view of the new ground(s) of rejection.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-8, 10-15, and 18-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reinhardt (US 5,541,607) in view of Hong (US 6,281,838).

- a) Regarding to claims 1, 13, 18, 22, 24, 25 and 30, Reinhardt disclose a signal processing system, comprising:

a component that receives an antenna point signal (Fig. 2; Col 3, L5-10) and conveys signals associated with antenna auto-tracking (beamforming facilitate auto-tracking of antenna); and a monolithic shift key modulation component (ASIC Col 2, L65-57; Col 6, L25-60).

Reinhardt discloses all the subject matters above except for the specific teaching of a positive-intrinsic negative (PIN) diode phase shifter.

However, Hong in the same field of endeavor, disclose a select line phase shifter using micro electromechanical system (MEMS), wherein PIN diode switches are used

through a plurality of phase shift paths to introduce a plurality of phase shifts to the signal based on one of number or combination of the plurality of phase shifting paths (Fig. 3; Col 4, L29-67). The loss and distortion experienced by the transmission signal is significantly reduced (Col 2, L52-54). Therefore, it is obvious to one of ordinary skill in art to combine the teaching of PIN diode switched delay line of Hong with the transmitter modulation system of Reinhardt. By doing so, reduce signal interference and improve signal transmission quality in a communication system.

- b) Regarding to claim 2, Reinhardt disclose the SK modulation component employing one or more binary phase shifters (Col 6, L25-60).
- c) Regarding to claim 3, Hong disclose the respective phase shifter comprising multiply phase shifting paths in series to introduce a plurality of phase shifts based on the number of paths (Fig. 3).
- d) Regarding to claims 4 and 12, Reinhardt disclose the binary phase shifters employed as a quadra-phase (QPSK) modulator to generate four phase shifts for the signal (Col 6, L25-60).
- e) Regarding to claim 5, Hong disclose paths constructed in accordance with an equivalent electrical length that corresponds to a desired phase shift (abstract).
- f) Regarding to claim 6, Hong disclose one or more reflective phase shifters (Col 1, L49-51; It implies that reflective phase shifters can be used instead of many other types of phase shifters).
- g) Regarding to claim 7, Hong disclose reflective phase shifters comprising two phase shifting sections (32a and 32b in Fig. 3), wherein respective phase shifting

Art Unit: 2611

sections comprise a hybrid coupled (Col 6, L19-25) and two PIN diode switches (36a and 36b).

h) Regarding to claim 8, Reinhardt disclose respective reflective phase shifters configured to generate at least a 90-degree phase shift and a 180-degrees phase shift via changing termination impedance state via the PIN diodes, wherein the 90 and 180 degree phase shifts are employed in connection to modulate the signal through four phase states (Col 6, L25-60).

i) Regarding to claim 10, Hong disclose a switched filter phase shifter that can be tuned for a particular phase shift over a plurality of frequencies (Col 3, L5-9).

j) Regarding to claim 11, Hong disclose the switched filter phase shifter comprising two parallel phase shifting networks in series (Fig. 3). Reinhardt disclose wherein respective networks provide two phase states, and coupling the networks provides for four phase states (Col 6, L25-60).

k) Regarding to claims 14, 21, and 29, Reinhardt disclose employed in connection with a satellite, aircraft or spacecraft (beamforming system; Col 1, L5-25).

l) Regarding to claim 15, Hong disclose a DC bias component employed to affect the impedance state of the PIN diode (Col 6, L34-57).

m) Regarding to claims 19, 20, 26 and 28, Hong disclose the phase shifting component employing one of a binary phase shifter, a reflective phase shifter, a hybrid phase shifter or a switched filter phase shifter (Col 1, L49-51). The phase shifting component comprising PIN diode switches (Fig. 3).

Art Unit: 2611

n) Regarding to claim 23, Reinhardt disclose a diagnostic component to verify and facilitate trouble shooting the phase shifting component (computer 40 in Fig. 3 and 48 in Fig. 4).

o) Regarding to claim 27, Reinhardt disclose one or more of filtering signal noise, amplifying the signal, low pass filtering the signal, high pass filtering the signal, band pass filtering the signal, encrypting the signal, decrypting the signal, encoding the signal, or decoding the signal (Col 4, L16-25).

4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reinhardt (US 5,541,607) in view of Hong (US 6,281,838), further in view of Taft et al (US 7,030,824).

Regarding to claim 9, Reinhardt and Hong disclose all the subject matters above except for the specific teaching of a hybrid phase shifter.

However, Taft teaches a hybrid phase shifter that comprises a transmission phase shifter (binary phase shifter) and a reflection phase shifter serially connected (Fig. 3D-G). The hybrid phase shifter provides precise phase control (Col 10, L54-58). Therefore, it is obvious to one of ordinary skill in art to combine the teaching of hybrid phase shifter of Taft in the transmitter modulation system of Reinhardt. By doing so, provide desirable phase controlled signal in a transmission system.

Art Unit: 2611

5. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reinhardt (US 5,541,607) in view of Hong (US 6,281,838), further in view of Mano (US 6,778,586).

Regarding to claim 16, Reinhardt and Hong disclose all the subject matters above except for the specific teaching of a RF component. However, Mano disclose a transmitter comprises a QPSK modulator (42), an amplifier (68) and a bandpass filter (66) to maximize power transfer and pass signals within a desired frequency band. In addition, this feature is also well known in the art. Therefore, it is obvious to one of ordinary skill in the art to combine the teaching of RF component of Mano with the transmitter modulation system of Reinhardt. By doing so, provide desirable transmission signal in a communication system.

6. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reinhardt (US 5,541,607) in view of Hong (US 6,281,838), further in view of Stiles (US 3,768,050).

Regarding to claim 17, Reinhardt and Hong disclose all the subject matters above except for the specific teaching of a high Q RF short component. However, such feature is well known in the art, and Stiles teaches a microwave integrated circuit (Col 6, L15-20). It is implicit that a high Q component would provide a higher quality of the circuit and improve overall performance. Therefore, it would have been obvious to one of ordinary skill in art to combine the teaching of high Q RF short component of Stiles

Art Unit: 2611

with the transmitter modulation system of Reinhardt. By doing so, provide more unit protection in a communication system.

### ***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eva Y Zheng whose telephone number is 571-272-3049. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 2611

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eva Yi Zheng  
Examiner  
Art Unit 2611

May 7, 2007

  
CHIEH M. FAN  
SUPERVISORY PATENT EXAMINER